

CLAIMS

1. A fluid pump, comprising:

a rotating chamber defined by first and second opposite wall surfaces and a  
5 third cylindrical wall surface for connecting the first and second wall surfaces to each other;

a rotor rotating about a rotating axis passing through the centers of the first and second wall surfaces within the rotating chamber, and including a hub with an outer circumferential surface and a vane protruding radially outwardly from the outer  
10 circumferential surface of the hub and having an outward radial tip which is slidably brought into close contact with the third wall surface of the rotating chamber, the vane further including a leading end which is slidably brought into close contact with the first wall surface of the rotating chamber, a trailing end which is slidably brought into close contact with the second wall surface of the rotating chamber, and inclines for connecting  
15 the leading and trailing ends; and

a pair of blocking walls cooperating with the vane and linearly moving upon rotation of the rotor, each of the blocking walls having an opposite edge facing each other, the opposite edges of the blocking walls being slidably brought into close contact with both side surfaces, other edges of the blocking walls adjacent the opposite edges  
20 being slidably brought into close contact with the outer circumferential surface of the hub of the rotor;

wherein a suction port for suction of a fluid and a discharge port for discharge of the fluid are provided at both positions adjacent to the pair of the blocking walls which are interposed between the ports;

25 wherein the third wall surface of the rotating chamber is provided with a suction groove positioned adjacent to the pair of the blocking walls and connected to the suction port to connect both spaces separated by the vane to each other, and a discharge groove positioned adjacent to the pair of the blocking walls and connected to the discharge port to connect the both spaces separated by the vane to each other.

2. The fluid pump as claimed in claim 1, wherein the pair of the blocking walls is formed integrally with each other.
3. The fluid pump as claimed in claim 1, wherein the leading and trailing ends of the vane are formed to be brought into surface contact with the first and second wall surfaces of the rotating chamber, and the width of the radial tip of each of the leading and trailing ends of the vane is formed to be larger than a maximum distance between the corresponding suction and discharge grooves.
4. The fluid pump as claimed in claim 1, further comprising first and second pressing plates which define the first and second wall surfaces of the rotating chamber, linearly move along the rotating axis and are slidably brought into close contact with the leading and trailing ends of the vane by an external force.
5. The fluid pump as claimed in claim 4, wherein the pressing plates are urged toward the rotating chamber by the fluid on a high-pressure side.
6. The fluid pump as claimed in claim 4, wherein the pressing plates are urged toward the rotating chamber by an elastic member.
7. The fluid pump as claimed in any one of claims 1 to 6, further comprising a pressure-regulating device for regulating pressure of the fluid discharged from the discharge ports and supplied to a load side.
8. The fluid pump as claimed in claim 7, wherein the fluid discharged from the discharge ports flows toward a return passage communicating with a low-pressure side and a discharge passage communicating with the load side through first and second branched passages, respectively; and the pressure-regulating device includes a discharge amount regulating unit having a moving member for moving according to the pressure of the fluid in the discharge passage to open and close the first passage and a check

valve provided in the second passage.

9. The fluid pump as claimed in claim 8, wherein the pressure-regulating device further comprises an elastic member for urging the moving member in a direction  
5 opposite to a direction in which the pressure of the fluid in the discharge passage is exerted on the moving member.

10. The fluid pump as claimed in any one of claims 1 to 6, wherein two leading ends, two tailing ends and two pairs of blocking walls are provided, and suction and  
10 discharge grooves are provided adjacent the two pairs of the blocking walls while being separated by the two pairs of blocking.

11. The fluid pump as claimed in claim 10, further comprising a pressure-regulating device for regulating pressure of the fluid discharged from the discharge ports  
15 and supplied to a load side.

12. The fluid pump as claimed in claim 11, wherein the fluid discharged through the two discharge ports provided at the discharge grooves flows toward first and second passages connected to a return passage communicating with a low-pressure side and  
20 toward third and fourth passages connected to a discharge passage communicating with a load side, and the pressure-regulating device includes a discharge amount regulating unit having a moving member for moving according to the pressure of the fluid in the discharge passage to open and close the first or second passage and first and second check valves provided in the third and fourth passages, respectively.

13. The fluid pump as claimed in claim 12, wherein the pressure-regulating device further comprises an elastic member for urging the moving member in a direction  
25 opposite to a direction in which the pressure of the fluid in the discharge passage is exerted on the moving member.

30

14. The fluid pump as claimed in any one of claims 8, 9 and 11 to 13, wherein the pressure-regulating device further includes an accumulating portion.

15. The fluid pump as claimed in claim 14, wherein the accumulating portion includes a moving member for moving by receiving the pressure of the fluid in the discharge passage, and an elastic member for urging the moving member in a direction opposite to a direction in which the pressure of the fluid is exerted on the moving member.

16. The fluid pump as claimed in any one of claims 1 to 6, wherein the pair of blocking walls have contact members that are brought into contact with both side surfaces of the vane, and each of the pair of blocking walls is provided with a receiving groove for receiving the contact member and a passage hole for causing the receiving groove to communicate with a discharge side.

17. A fluid motor, comprising:

a rotating chamber defined by first and second opposite wall surfaces and a third cylindrical wall surface for connecting the first and second wall surfaces to each other;

a rotor rotating about a rotating axis passing through the centers of the first and second wall surfaces within the rotating chamber, and including a hub with an outer circumferential surface and a vane protruding radially outwardly from the outer circumferential surface of the hub and having an outward radial tip which is slidably brought into close contact with the third wall surface of the rotating chamber, the vane further including a leading end which is slidably brought into close contact with the first wall surface of the rotating chamber, a trailing end which is slidably brought into close contact with the second wall surface of the rotating chamber, and inclines for connecting the leading and trailing ends; and

a pair of blocking walls cooperating with the vane and linearly moving upon rotation of the rotor, each of the blocking walls having an opposite edge facing each

other, the opposite edges of the blocking walls being slidably brought into close contact with both side surfaces, other edges of the blocking walls adjacent the opposite edges being slidably brought into close contact with the outer circumferential surface of the hub of the rotor;

5            wherein an inlet port for inflow of a fluid and an outlet port for outflow of the fluid are provided at both positions adjacent to the pair of the blocking walls which are interposed between the inlet and outlet ports;

             wherein the third wall surface of the rotating chamber is provided with an inflow groove positioned adjacent to the pair of the blocking walls and connected to the inlet port to connect both spaces separated by the vane to each other, and an outflow  
10            groove positioned adjacent to the pair of the blocking walls and connected to the outlet port to connect the both spaces separated by the vane to each other.

18.        The fluid motor as claimed in claim 17, wherein the pair of the blocking walls  
15            is formed integrally with each other.

19.        The fluid motor as claimed in claim 17, wherein the leading and trailing ends of the vane are formed to be brought into surface contact with the first and second wall surfaces of the rotating chamber, and the width of a radial tip of each of the leading and trailing ends of the vane is formed to be larger than a maximum distance between the  
20            corresponding inflow and outflow groove.

20.        The fluid motor as claimed in claim 17, further comprising first and second pressing plates which form the first and second wall surfaces of the rotating chamber, linearly move along the rotating axis and are brought into close contact with the leading and trailing ends of the vane by an external force.  
25           

21.        The fluid motor as claimed in claim 20, wherein the pressing plates are urged toward the rotating chamber by the fluid on a high-pressure side.

22. The fluid motor as claimed in claim 20, wherein the pressing plates are urged toward the rotating chamber by an elastic member.